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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/526,298

10/13/2005

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EXAMINER

MCCAIG, BRIAN A

ART UNIT

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1797

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/526,298	Applicant(s) RIVERS ET AL.	
	Examiner BRIAN MCCAIG	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>March 1, 2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. This is the initial Office action based on the 10/526298 application filed March 1, 2005.
2. Claims 1-18 are pending and have been fully considered.

Specification

3. The disclosure is objected to because of the following informalities:
 - a. Page 8, paragraph 1: apparent misuse of abbreviation in the sentence "This class of poly(propylene imine) dendrimers. . .," and
 - b. Page 11, paragraph 1: "polypropyleneimine" is misspelled.Appropriate correction is required.

Claim Objections

6. Claim 8 objected to because of the following informalities: Claim 8 recites the limitation of the method for inhibiting formation of hydrocarbon hydrates in a mixture comprising water and hydrate-forming guest molecules in which the composition comprises from about 10 to about 3000 ppm of at least one surfactant in claim 1. There is insufficient antecedent basis for this limitation in the claim because claim 1 does not include a surfactant. For the purposes of continued examination, the Examiner assumes that claim 8 is dependent on claim 6.

Appropriate correction is required.

Claims 5,6,7,8,12,13,14,16, are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim Cannot form the basis of another multiple dependent claim. See MPEP § 608.01(n).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-5, 9-13, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over TALLEY ET AL (US 5900516) in view of KLOMP (WO 01/77270) and COLLE ET AL (US 5583273) as evidenced by SEILER ET AL in *Separation and Purification Technology* (2003, vol 30, pg 179-197), hereafter referred to as TALLEY, KLOMP, COLLE, and SEILER, respectively.**

9. With respect to claims 1, 4, 9, 12 and 17, TALLEY discloses a method for inhibiting formation of hydrocarbon hydrates in a mixture comprising water and hydrate-forming guest molecules, the method comprising contacting the mixture with a composition which comprises a combination of one or more hydrate inhibiting compounds where the composition amount is effective in inhibiting formation of the hydrocarbon hydrates in the mixture [column 18, lines 28-31]. TALLEY further discloses that the inventive hydrate inhibiting compounds are glass-forming compounds capable of inhibiting long-range ordering required for hydrate nucleation [column 4, lines 7-12] and are comprised of a polymer backbone that is water soluble [column 6, lines 58-61]; an anchor that provides hydrogen bonding for keeping water molecules in the shell around a guest group (to be discussed next) intact and includes constituents such as carbonyls, amines, ethers, sulfonates, and sulfones [column 6, lines 25-45]; and a guest group, which is hydrophobic or amphiphilic and possesses an adaptable shape [column 4, lines 66-67 & column 5, lines 3-4]. Additionally, TALLEY teaches that glass-forming polymers suitable for destroying labile clusters should have at least one hydrogen bonding atom and the ability to keep surrounding it in a non-freezable state [column 4, lines 18-21].

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10. TALLEY does not appear to explicitly disclose the use of at least one dendrimeric compound having a number average molecular weight of at least 1,000 atomic mass units (amu) and at least one small molecular weight species having less than 1,000 amu, selected from the group consisting of polyalkyleneimine, polyallylamine, starch, sugars, and polymers or copolymers of vinyl alcohol or allyl alcohol.

11. However, KLOMP discloses a method for inhibiting formation of hydrocarbon hydrates similar to TALLEY which uses a dendritic poly(esteramide) polymer (an obvious variant of the dendrimeric compound of the instant application), and more specifically discloses, for example, HYBRANE S1200, which contains the water-soluble backbone, anchor and guest group taught by TALLEY as evidenced by SEILER [page 182, figure 1c], wherein the oxygen in the -OH end group is the least one hydrogen bonding atom taught by TALLEY and the amide, carbonyl, and carboxylate groups each form anchors as taught by the same reference. Furthermore, KLOMP teaches that these compounds have molecular weights greater than 1,000 amu [page 5, line 21-page 8, line 25]. Similarly, COLLE discloses a small molecular weight species having less than 1,000 amu [column 4, line 57-column 5, line 2], selected from the group consisting of polyalkyleneimine such as a N-acyl-substituted polyalkyleneimine that is an effective inhibitor of hydrate nucleation, growth, and/or agglomeration (hydrate formation) [column 4, lines 32-67], wherein the $N-CH_2-(H_2C)_n-$ corresponds to the backbone of TALLEY, the $C=O$ corresponds to the anchor, and the R group corresponds to the guest group.

12. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the dendrimer compound of KLOMP and the small molecular weight species of COLLE in the composition of TALLEY because the aforementioned compound and species are obvious variants of the glass-forming polymer of TALLEY. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

13. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the dendrimer compound of KLOMP and the small molecular weight species of COLLE in the

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composition of TALLEY, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of choice. *In re Leshin*, 125 USPQ 416.

14. With respect to claims 2, 3, 10, and 11, KLOMP discloses [page 5, line 21-page 8, line 25] a dendrimeric compound consisting of a branched polymer having at least one acyclic pendant group containing 3 to 7 carbon atoms which also contains nitrogen and oxygen heteroatoms and which is a condensation polymer containing ester groups and at least one amide group in the backbone and has at least one hydroxyalkylamide end group and a number average molecular weight greater than 1,000 as evidenced by SEILER [figure 1c].

15. With respect to claims 5 and 13, COLLE discloses that the small molecular weight species has at least one cyclic or acyclic pendant group containing 3 to 6 carbons (if the pendant group is cyclic) [column 5, lines 27-42] or more (if the pendant group is acyclic) [column 4, lines 44-59].

16. With respect to claim 18, TALLEY discloses that hydrate guest-forming molecules include methane, ethane, ethylene, propane, propylene, isobutane, n-butane, isobutene, oxygen, nitrogen, carbon dioxide, and hydrogen sulfide [column 1, lines 29-37].

17. **Claims 6-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over TALLEY ET AL (US 5900516) in view of KLOMP (WO 01/77270), COLLE ET AL (US 5583273), and SEILER ET AL in *Separation and Purification Technology* as applied to claims 1-5, 9-13, and 17-18 above and further in view of KLOMP ET AL (EP 0824631 B1), hereafter referred to as TALLEY, KLOMP, COLLE, SEILER, and KLOMP '631, respectively.**

18. Reference is made to the discussion of modified TALLEY in the preceding paragraphs. Furthermore, COLLE discloses that the quantity of the small molecular weight species ranges from 0.01 to about 5 wt % [column 4, lines 13-16], and KLOMP discloses that the quantity of the dendrimeric compound ranges from 0.05 to 10 wt % [page 8, lines 19-25].

19. Modified TALLEY does not appear to explicitly disclose that the composition further comprises a cationic, anionic, or nonionic surfactant selected from the group consisting of polyoxyethylene ethers, sorbitans, long chain

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alcohols, sulphates, diols, fatty acids, alkylated ammonium compounds, phosphonium compounds, sulphonium compounds and mixtures thereof.

20. However, KLOMP '631 discloses a method for inhibiting the plugging of conduits by gas hydrates similar to TALLEY containing a mixture of low-boiling hydrocarbons and water wherein the inhibitor is comprised of a alkylated ammonium or phosphonium surfactant compound and is present in an amount of 1000-50,000 ppm, which overlaps the concentration range of claim 8 of the instant application [paragraphs 0001, 0009-0016, & 0022].

21. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the surfactant of KLOMP '631 in the composition of modified TALLEY since TALLEY discloses the a mixture with a composition which comprises a combination of one or more hydrate inhibiting compounds, and it has been held to be within the general skill of a worker in the art to select a known material such as an alkylated ammonium compound on the basis of its suitability for the intended use as a hydrate forming inhibitor as a matter of choice. *In re Leshin*, 125 USPQ 416.

Conclusion

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571) 270-5548. The examiner can normally be reached on M-F 8-430.

23. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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24. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM
10/21/2008

/Glenn A Caldarola/
Acting SPE of Art Unit 1797